

M|O|D

Smart contract

SECURITY AUDIT REPORT

Project – Fruit Party
Platform – Avalanche
Date – 04/20/2022

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Background

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be used to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

Project Information

- **Platform:** Avalanche network
- **Contract Address:** 0x723073Ad1Fd3D2A5FE22D84B6CF632661b4ea3b5
- **Code:**

<https://testnet.snowtrace.io/address/0xb7df4a9a2baa72a70a9d50c062200c321c6f20ec#code>

Contracts address deployed to test net (Avalanche)

Fruit Party contract on AVAX test net to test every function by the auditor.

<https://testnet.snowtrace.io/address/0x723073ad1fd3d2a5fe22d84b6cf632661b4ea3b5>

Executive Summary

According to our assessment, the customer`s solidity smart contract is **Very Secure**.



Automated checks are with remix IDE. All issues were performed by the team, which included the analysis of code functionality, manual audit found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the audit overview section. The general overview is presented in the Project Information section and all issues found are located in the audit overview section.

Team found 0 critical, 0 high, 0 medium, 2 low, 0 very low-level issues and 0 note in all solidity files of the contract

The files:

FruitParty.sol

File and Function Level Report

File in Scope:

Contract Name	SHA 256 hash	Contract Address
FruitParty.sol	3c99a4c6bc1c90824210863fa31c8b72d1a55fc3c73ae6c50d96ac62ab365720	0x723073Ad1Fd3D2A5FE22D84B6CF632661b4ea3b5

- Contract: FruitParty
- Inherit: Context, Ownable
- Observation: All passed including security check
- Test Report: passed
- Score: passed
- Conclusion: passed

Function	Test Result	Type / Return Type	Score
calculateFruitBuySimple	✓	Read / public	Passed
calculateFruitBuy	✓	Read / public	Passed
calculateFruitSell	✓	Read / public	Passed
fruitRewards	✓	Read / public	Passed
getBalance	✓	Read / public	Passed
getFruitsSinceLastHatch	✓	Read / public	Passed
Owner	✓	Read / public	Passed
getMyFruits	✓	Read / public	Passed
getMinters	✓	Read / public	Passed

buyFruits	✓	Write / payable	Passed
renounceOwnership	✓	Write / public	Passed
sellFruits	✓	Write / public	Passed
hatchFruits	✓	Write / public	Passed
transferOwnership	✓	Write / public	Passed
seedMarket	✓	Write / payable	Passed

Issues Checking Status

No.	Issue Description	Checking Status
1	Compiler warnings.	Passed
2	Race conditions and Reentrancy. Cross-function race conditions.	Passed
3	Possible delays in data delivery.	Passed
4	Oracle calls.	Passed
5	Design Logic.	Passed
6	Timestamp dependence.	Passed with Notes
7	Integer Overflow and Underflow.	Passed
8	DoS with Revert.	Passed
9	DoS with block gas limit.	Passed with Notes
10	Methods execution permissions.	Passed
11	Economy model. If application logic is based on an incorrect economic model, the application would not function correctly and participants would incur financial losses. This type of issue is most often found in bonus rewards systems, Staking and Farming contracts, Vault and Vesting contracts, etc.	Passed
12	The impact of the exchange rate on the logic.	Passed
13	Private user data leaks.	Passed
14	Malicious Event log.	Passed
15	Scoping and Declarations.	Passed
16	Uninitialized storage pointers.	Passed
17	Arithmetic accuracy.	Passed

Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to tokens loss etc.
High	High-level vulnerabilities are difficult to exploit; however, they also have significant impact on smart contract execution, e.g. public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to tokens lose
Low	Low-level vulnerabilities are mostly related to outdated, unused etc. code snippets, that can't have significant impact on execution
Note	Lowest-level vulnerabilities, code style violations and info statements can't affect smart contract execution and can be ignored.

Audit Findings

Critical:

No Critical severity vulnerabilities were found.

High:

No High severity vulnerabilities were found.

Medium:

No Medium severity vulnerabilities were found

Low:

#Multiple pragma statements

Line	Pragma
6	pragma solidity 0.8.9;
241	pragma solidity 0.8.9;

Description

There are multiple pragma statements in the code. Only the compiler version 0.8.9 will work with the code, but keeping only one pragma statement helps in maintaining readability of the code.

Remediation

Keep a single pragma statement.

Status: **Closed**. Fixed In version 2

#Use of block.timestamp for comparisons

Description

The value of block.timestamp can be manipulated by the miner.
And conditions with strict equality is difficult to achieve -
block.timestamp

Remediation

Avoid use of block.timestamp

Status: **Acknowledged**

Very Low:

No Very Low severity vulnerabilities were found.

Notes:

No Notes vulnerabilities were found.

Automatic Testing

1- Check for security

3c99a4c6bc1c90824210863fa31c8b72d1a55fc3c73ae6c50d96ac62ab365720
File: FruitPar... | Language: solidity | Size: 13647 bytes | Date: 2022-04-20T14:50:45.858Z

Critical	High	Medium	Low	Note
0	0	0	0	0



2- SOLIDITY STATIC ANALYSIS

SOLIDITY STATIC ANALYSIS

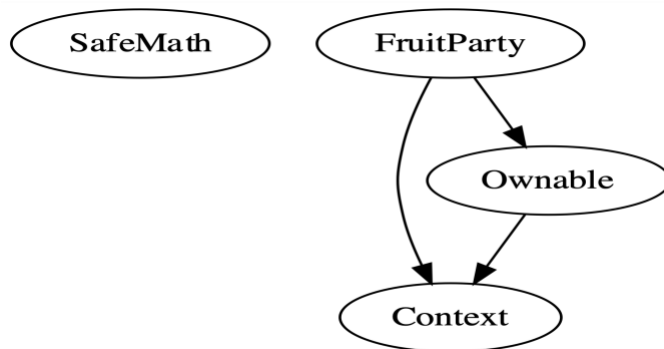
☒ Select all ☒ Autorun Run

- Security**
 - ☒ **Select Security**
 - ☒ **Transaction origin:**
'tx.origin' used
 - ☒ **Check-effects-interaction:**
Potential reentrancy bugs
 - ☒ **Inline assembly:**
Inline assembly used
 - ☒ **Block timestamp:**
Can be influenced by miners
 - ☒ **Low level calls:**
Should only be used by experienced devs
 - ☒ **Block hash:**
Can be influenced by miners
 - ☒ **Selfdestruct:**
Contracts using destructed contract can be broken
- Gas & Economy**
 - ☒ **Select Gas & Economy**
 - ☒ **Gas costs:**
Too high gas requirement of functions
 - ☒ **This on local calls:**
Invocation of local functions via 'this'
 - ☒ **Delete dynamic array:**
Use require/assert to ensure complete deletion
 - ☒ **For loop over dynamic array:**
Iterations depend on dynamic array's size
 - ☒ **Ether transfer in loop:**
Transferring Ether in a for/while/do-while loop

SOLIDITY STATIC ANALYSIS

- ERC**
 - ☒ **Select ERC**
 - ☒ **ERC20:**
'decimals' should be 'uint8'
- Miscellaneous**
 - ☒ **Select Miscellaneous**
 - ☒ **Constant/View/Pure functions:**
Potentially constant/view/pure functions
 - ☒ **Similar variable names:**
Variable names are too similar
 - ☒ **No return:**
Function with 'returns' not returning
 - ☒ **Guard conditions:**
Ensure appropriate use of require/assert
 - ☒ **Result not used:**
The result of an operation not used
 - ☒ **String length:**
Bytes length != String length
 - ☒ **Delete from dynamic array:**
'delete' leaves a gap in array
 - ☒ **Data truncated:**
Division on int/uint values truncates the result

3- Inheritance graph



4- SOLIDITY UNIT TESTING

SOLIDITY UNIT TESTING

Test your smart contract in Solidity.

Select directory to load and generate test files.

Test directory:

☒ Select all

☒ tests/FruitParty_test.sol

Progress: 1 finished (of 1)

PASS testSuite

(tests/FruitParty_test.sol)

✓ Before all

✖

✓ Check success

✖

✓ Check success2

✖

✓ Check failure

✖

✓ Check sender and value

✖

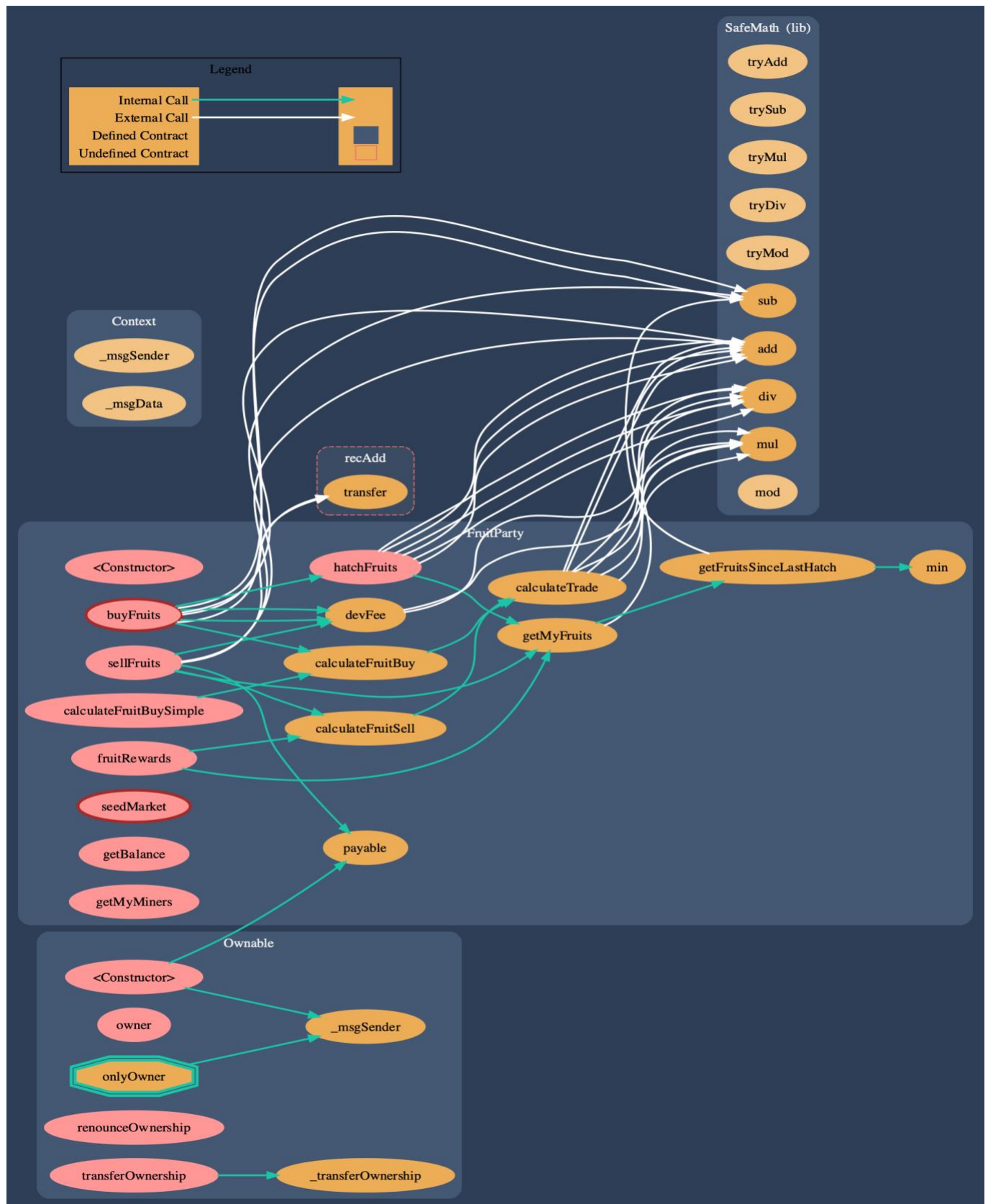
Result for tests/FruitParty_test.sol

Passed: 5

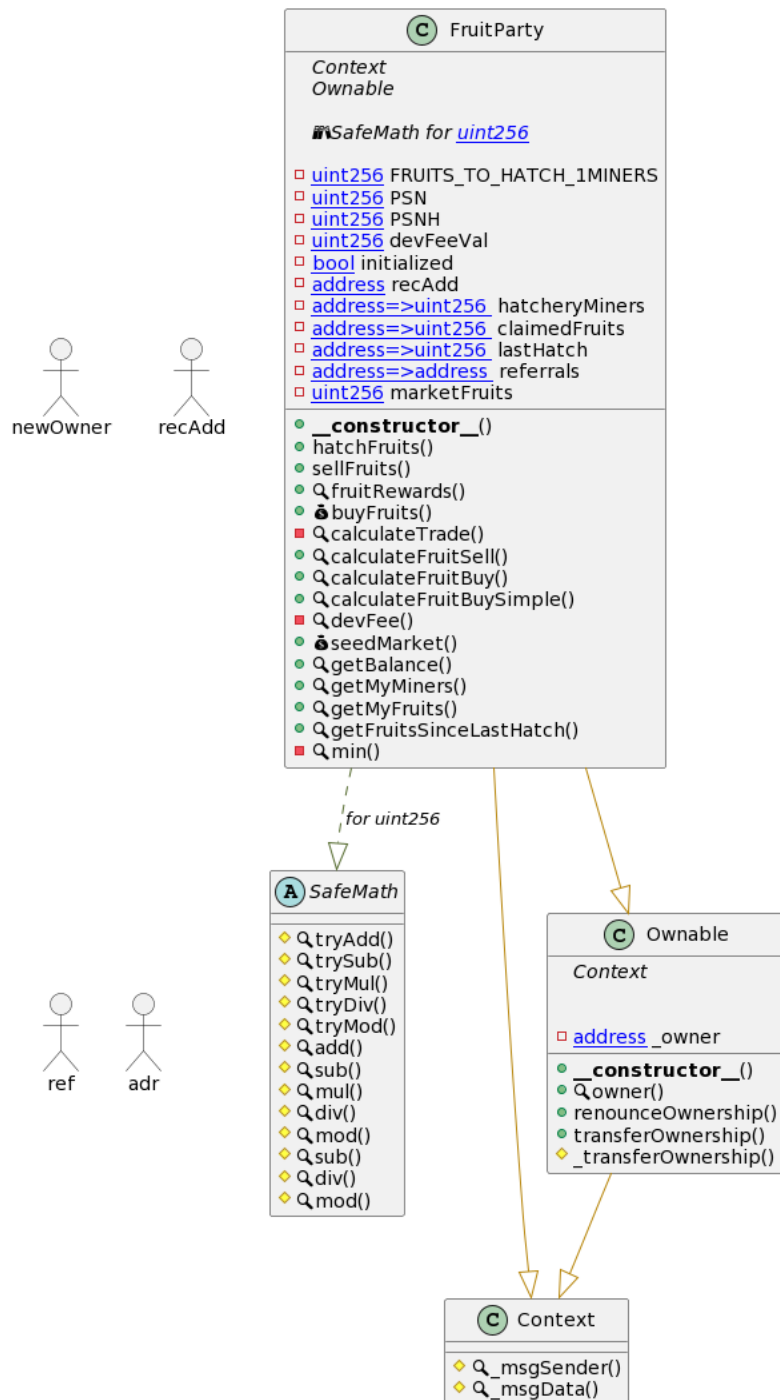
Failed: 0

Time Taken: 6.88s

5- Call graph



Unified Modeling Language (UML)



Functions signature

Sighash		Function Signature
=====		
884557bf	=>	tryAdd(uint256,uint256)
a29962b1	=>	trySub(uint256,uint256)
6281efa4	=>	tryMul(uint256,uint256)
736ecb18	=>	tryDiv(uint256,uint256)
38dc0867	=>	tryMod(uint256,uint256)
771602f7	=>	add(uint256,uint256)
b67d77c5	=>	sub(uint256,uint256)
c8a4ac9c	=>	mul(uint256,uint256)
a391c15b	=>	div(uint256,uint256)
f43f523a	=>	mod(uint256,uint256)
e31bdc0a	=>	sub(uint256,uint256,string)
b745d336	=>	div(uint256,uint256,string)
71af23e8	=>	mod(uint256,uint256,string)
119df25f	=>	_msgSender()
8b49d47e	=>	_msgData()
8da5cb5b	=>	owner()
715018a6	=>	renounceOwnership()
f2fde38b	=>	transferOwnership(address)
d29d44ee	=>	_transferOwnership(address)
c65094de	=>	hatchFruits(address)
db5e5a8cf	=>	sellFruits()
f49178e6	=>	fruitRewards(address)
8343419a	=>	buyFruits(address)
229824c4	=>	calculateTrade(uint256,uint256,uint256)
c7d1d941	=>	calculateFruitSell(uint256)
b7bc51bd	=>	calculateFruitBuy(uint256,uint256)
3ba44ec7	=>	calculateFruitBuySimple(uint256)
3bc0461a	=>	devFee(uint256)
3c5f07cb	=>	seedMarket()
12065fe0	=>	getBalance()
4b634b06	=>	getMyMiners(address)
55d3fe9b	=>	getMyFruits(address)
04ce6a07	=>	getFruitsSinceLastHatch(address)
7ae2b5c7	=>	min(uint256,uint256)






Automatic general report

Files Description Table



File Name	SHA-1 Hash
/Users/macbook/Desktop/smart contracts/FruitParty.sol	2a6fb2f6240e34ef790fbad06c2dafa0843ee9d

Contracts Description Table

Contract	Type		Bases	
:-----: :-----: :-----: :-----:				
:-----:				
L	**Function Name**	**Visibility**	**Mutability**	
Modifiers				
SafeMath	Library			
L	tryAdd	Internal		
L	trySub	Internal		
L	tryMul	Internal		
L	tryDiv	Internal		
L	tryMod	Internal		
L	add	Internal		
L	sub	Internal		
L	mul	Internal		
L	div	Internal		
L	mod	Internal		
L	sub	Internal		
L	div	Internal		
L	mod	Internal		
Context	Implementation			
L	_msgSender	Internal		
L	_msgData	Internal		
Ownable	Implementation	Context		
L	<Constructor>	Public		NO
L	owner	Public		NO
L	renounceOwnership	Public		onlyOwner
L	transferOwnership	Public		onlyOwner
L	_transferOwnership	Internal		
FruitParty	Implementation	Context, Ownable		
L	<Constructor>	Public		NO
L	hatchFruits	Public		NO
L	sellFruits	Public		NO

L	fruitRewards	Public	!		NO	!	
L	buyFruits	Public	!		NO	!	
L	calculateTrade	Private					
L	calculateFruitSell	Public	!		NO	!	
L	calculateFruitBuy	Public	!		NO	!	
L	calculateFruitBuySimple	Public	!		NO	!	
L	devFee	Private					
L	seedMarket	Public	!		onlyOwner		
L	getBalance	Public	!		NO	!	
L	getMyMiners	Public	!		NO	!	
L	getMyFruits	Public	!		NO	!	
L	getFruitsSinceLastHatch	Public	!		NO	!	
L	min	Private					

Legend

Symbol	Meaning
:-----:	-----
	Function can modify state
	Function is payable

Conclusion

The contracts are written systematically. Team found no critical issues. As such, it is clear for production.

Since possible test cases can be unlimited and developer level documentation (code flow diagram with function level description) not provided, for such an extensive smart contract protocol, we provide no such guarantee of future outcomes. We have used all the latest static tools and manual observations to cover maximum possible test cases to scan everything.

Security state of the reviewed contract is “Very Secure”.

- ✓ No volatile code.
- ✓ No high severity issues were found.

Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against the team on the basis of what it says or doesn't say, or how team produced it, and it is important for you to conduct your own independent investigations before making any decisions. The team will go into more detail on this in the disclaimer below – please make sure to read it in full.

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